MyoGel is a new biomaterial created by Biolink which has so far only been tested in animals, but has yielded promising results. Its creators hope it will be an improvement to already existing biomaterials such as PuraMatrix™, AlloDerm®, and Surgisis®. Although these materials are highly useful, they do have some drawbacks including: a tendency to disintegrate/erode too quickly within the body, as well as rejection and risk of infection if derived from an animal source.

Scientists have created MyoGel with a combination of Growth Factors, Cytokines, and Extracellular Matrix (ECM) Protein Constituents. Growth Factors can be in the form of a protein or steroid and stimulates cell growth within the body. Cytokines are a type of Growth Factor that is released by the cells of the immune system in response to a problem or disruption in the body. They are used in cell-to-cell communication when the cells in one area need to communicate with the immune system throughout the rest of the body. Some of the ECM Protein Constituents found in MyoGel include: Laminin, Collagen IV, entactin / nidogen, heparin sulphate, and proteoglycan. They can be found in the connective tissue of most animals and are important in the growth and healing processes. All of these substances are taken from the skeletal muscle tissue of humans, rats, or swine.

In the future MyoGel could be used for cellular regrowth, adipose tissue engineering, and adipose differentiation in both in vivo and in vitro environments. In vivo, meaning “Within the Living”, is used in the cellular growth of whole, living organisms. In vitro, meaning “Within the Glass”, is used in the cellular experimentation within an isolated, controlled environment with non-living organisms.

Very recently reports have been made of Australian scientists from the Bernard O’Brien Institute of Microsurgery who are on their way to creating a procedure, using MyoGel, to regrow breast tissue. At this point scientist hope that within three years they will be able to complete all trials, and have a method approved to regrow tissue in patients who have suffered from the loss of their breast(s) due to cancer treatment. (This procedure may also be used for general breast enlargement, but scientists say that is of lower priority and will not likely be available for at least ten years.)

The procedure for this method is quite simple and only requires three main steps. First a biodegradable synthetic chamber is placed beneath the skin of the chest. Then one of the underarm blood vessels is redirected through one of the many holes in the chamber. Finally the blood vessel is connected to a small cluster composed of the patient’s own fat stem cells along with the MyoGel combination. Over a period of time the fat cells will multiply continuously until a breast is formed, once the breast is formed the chamber will begin to dissolve. This study has been carried out successfully in pigs and the breast tissue took only six weeks to develop completely. Because humans generally stop breast growth during adolescence, it may take four to six months for human development.

This is a very important development for women suffering with the loss of one or both breasts because up until now they must either live without breast tissue or resort to plastic surgery.
Myogel, a novel, basement membrane-rich, extracellular matrix derived from skeletal muscle, is highly adipogenic in vivo and in vitro.


http://en.wikipedia.org/wiki/In_vivo

Novel Human Adipogenic Cell Matrix – MyoGel


New breast hope for cancer women

http://news.bbc.co.uk/2/hi/health/3149991.stm